

What is claimed is:

1. A method of fabricating a device using a photolithographic process, wherein a wavelength of light is used during the photolithographic process, the method

5 comprising:

providing an anti-reflective coating over a surface of a substrate;

providing a layer which is transparent to the wavelength of light over the anti-reflective coating;

10 providing a photosensitive material above the layer that is transparent to the wavelength of light; and

exposing the photosensitive material to a source of radiation including the wavelength of light.

2. The method of claim 1 wherein the anti-reflective coating extends beneath substantially the entire transparent layer.

3. The method of claim 2 wherein providing an anti-reflective coating includes providing an anti-reflective coating with a complex refractive index which increases absorption of light passing through an interface 20 of the transparent layer and the anti-reflective coating.

4. The method of claim 2 wherein exposing the photosensitive material to a source of radiation includes selectively exposing portions of the photosensitive material 25 to the radiation.

5. The method of claim 4 further including: developing the photosensitive material after exposure to the source of radiation; and

transferring a pattern defined by the remaining photosensitive material to at least one underlying layer.

6. The method of claim 2 wherein exposing the photosensitive material to a source of radiation includes
5 exposing the photosensitive material to radiation having a wavelength of approximately 193 nm.

7. The method of claim 2 wherein exposing the photosensitive material to a source of radiation includes
10 exposing the photosensitive material to radiation having a wavelength of approximately 248 nm.

8. The method of claim 2 wherein exposing the photosensitive material to a source of radiation includes
exposing the photosensitive material to radiation having a wavelength of approximately 365 nm.

15 9. A method of fabricating a device using a photolithographic process, wherein a wavelength of light is used during the photolithographic process, the method comprising:

20 forming a first anti-reflective coating over a substrate;

providing a layer which is transparent to the wavelength of light over the first anti-reflective coating;

forming a second anti-reflective coating over the layer which is transparent to the wavelength of light;

25 providing a photosensitive material over the second anti-reflective coating; and

exposing the photosensitive material to a source of radiation including the wavelength of light.

10. The method of claim 9 wherein providing a first anti-reflective coating includes providing an anti-reflective layer with a complex refractive index which increases absorption of light passing through an interface 5 of the transparent layer and the first anti-reflective coating.

11. The method of claim 10 wherein providing a second anti-reflective coating includes providing an anti-reflective layer with a complex refractive index which 10 reduces reflectivity of light at an interface between the photosensitive material and the second anti-reflective coating.

12. The method of claim 11 wherein exposing the photosensitive material to a source of radiation 15 includes selectively exposing portions of the photosensitive material to the radiation, the method further including: developing the photosensitive material after exposure to the source of radiation; and transferring a pattern defined by the remaining 20 photosensitive material to at least one underlying layer.

13. A semiconductor device comprising:
a layer that is transparent to light having a wavelength of approximately 248 nm;
a first anti-reflective coating extending 25 substantially entirely beneath the transparent layer.

14. The semiconductor device of claim 13 wherein the first anti-reflective coating has a complex refractive index with an imaginary part whose value is at least one.

15. The semiconductor device of claim 13
wherein the transparent layer includes a material selected
from the group consisting of BPSG, PSG and TEOS.

16. The semiconductor device of claim 13
5 wherein the transparent layer includes an oxide.

17. The semiconductor device of claim 13
wherein the first anti-reflective coating includes a
material comprising an organic polymer.

18. The semiconductor device of claim 13
10 wherein the first anti-reflective coating includes a
material comprising silicon and nitrogen.

19. The semiconductor device of claim 13
wherein the first anti-reflective coating includes a
material comprising silicon and oxygen.

15 20. The semiconductor device of claim 13
further including:
a second anti-reflective coating extending over
the transparent layer.

21. A semiconductor device comprising:
20 a layer that is transparent to light having a
wavelength of approximately 365 nm;
a first anti-reflective coating extending
substantially entirely beneath the transparent layer.

22. The semiconductor device of claim 21
25 wherein the first anti-reflective coating has a complex

refractive index with an imaginary part whose value is at least one.

23. The semiconductor device of claim 21 wherein the transparent layer includes a material selected
5 from the group consisting of BPSG, PSG and TEOS.

24. The semiconductor device of claim 21 wherein the transparent layer includes an oxide.

25. The semiconductor device of claim 21 wherein the first anti-reflective coating includes a
10 material comprising silicon and nitrogen.

26. The semiconductor device of claim 21 wherein the first anti-reflective coating includes a material comprising silicon and oxygen.

27. The semiconductor device of claim 21
15 further including:
a second anti-reflective coating extending over
the transparent layer.

28. A semiconductor device comprising:
a layer that is transparent to light having a
20 wavelength of approximately 193 nm;
a first anti-reflective coating extending
substantially entirely beneath the transparent layer.

29. The semiconductor device of claim 28
wherein the first anti-reflective coating has a complex
25 refractive index with an imaginary part whose value is at least one.

30. The semiconductor device of claim 28
wherein the transparent layer includes a material selected
from the group consisting of BPSG, PSG and TEOS.

31. The semiconductor device of claim 28
5 wherein the transparent layer includes an oxide.

32. The semiconductor device of claim 28
wherein the first anti-reflective coating includes a
material comprising silicon and nitrogen.

33. The semiconductor device of claim 28
10 wherein the first anti-reflective coating includes a
material comprising silicon and oxygen.

34. The semiconductor device of claim 28
further including:
a second anti-reflective coating extending over
15 the transparent layer.